Volunteer Lake Assessment Program Individual Lake Reports

BERRY BAY, FREEDOM, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	230,326	**Max. Depth (m):**	11.6	**Flushing Rate (yr^{1})**	254
Surface Area (Ac.):	145	**Mean Depth (m):**	3.7	**P Retention Coef:**	-0.01
Shore Length (m):	5,800	**Volume (m^3):**	2,147,000	**Elevation (ft):**	406

TROPHIC CLASSIFICATION

Year	Trophic class
1987	OLIGOTROPHIC
2003	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

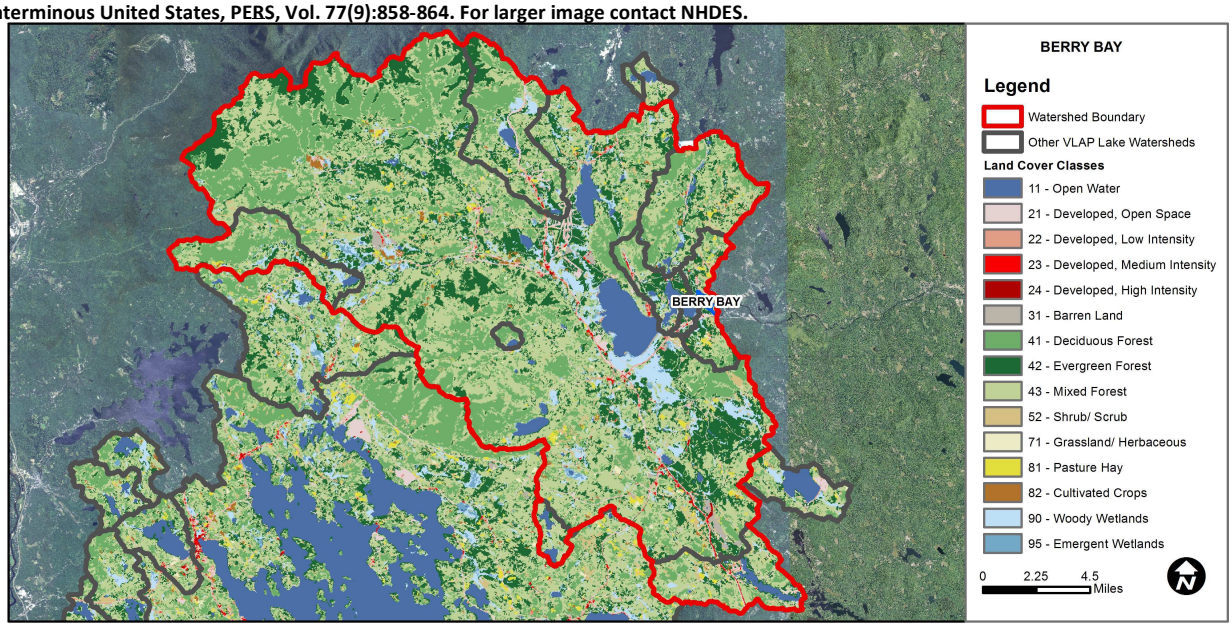
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	No Data	No Data for this parameter.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

BROAD BAY - CAMP ROBIN HOOD BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
BROAD BAY - CAMP HUCKINS BEACH	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
LEAVITT BAY - CAMP MARIST BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



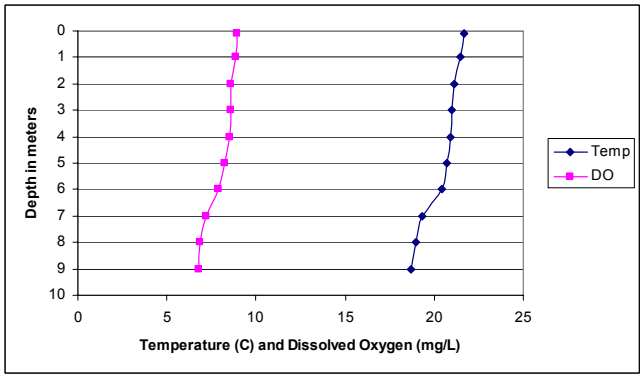
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.63	Barren Land	0.63	Grassland/Herbaceous	0.36
Developed-Open Space	3.02	Deciduous Forest	23.03	Pasture Hay	0.93
Developed-Low Intensity	0.78	Evergreen Forest	20.56	Cultivated Crops	0.49
Developed-Medium Intensity	0.25	Mixed Forest	38.3	Woody Wetlands	4.62
Developed-High Intensity	0.04	Shrub-Scrub	2.7	Emergent Wetlands	0.6

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
BERRY BAY, FREEDOM, NH
2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic*)

- **CHLOROPHYLL-A:** The 2012 average chlorophyll level was slightly higher than previous years, however historical trend analysis indicates chlorophyll levels have remained stable since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride were average for most NH lakes; however the metalimnion value was much lower than normal. A laboratory error may have occurred.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels were low and historical trend analysis indicates a relatively stable epilimnetic (upper water layer) phosphorus level since monitoring began.
- **TRANSPARENCY:** Transparency was lower in 2012 than previous years. Historical trend analysis indicated transparency levels tend to fluctuate annually.
- **TURBIDITY:** Deep spot turbidity levels were low in 2012.
- **pH:** Average pH decreased to undesirable levels in the hypolimnion (lower water layer).
- **RECOMMENDED ACTIONS:** Conduct monthly deep spot water quality monitoring (June, July and August). Collect monthly phytoplankton and dissolved oxygen and temperature profiles to better assess water quality conditions.

Dissolved Oxygen & Temperature Profile



Berry Bay Phytoplankton Population

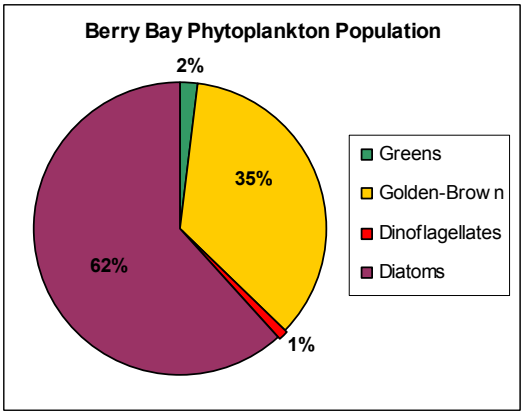


Table 1. 2012 Average Water Quality Data for BERRY BAY

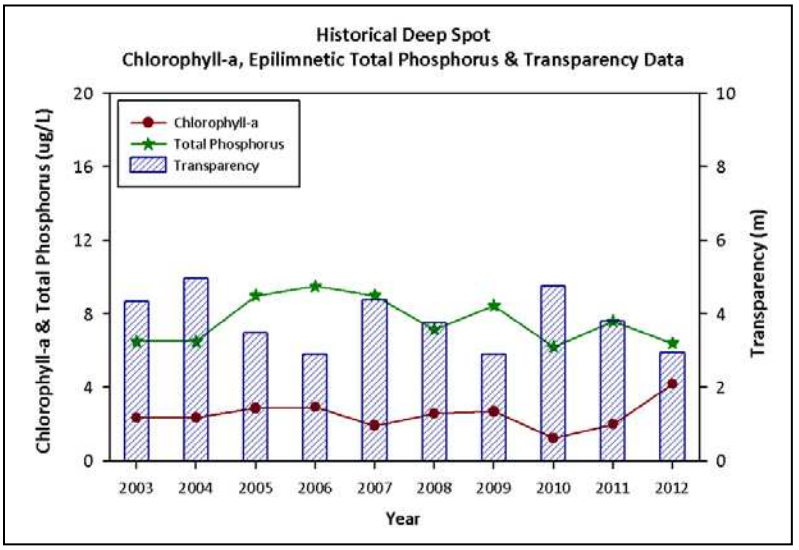
Station Name	Alk.	Chlor-a	Chloride	Cond.	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	ug/l	m		ntu	
						NVS	VS		
Deep Epilimnion	2.8	4.18	4	36.5	6	2.95		0.64	6.63
Deep Metalimnion				18.6	7		4.00	0.66	6.54
Deep Hypolimnion				46.1	8			0.85	6.36

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Stable	Data not significantly increasing or decreasing.
Transparency	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Phosphorus (epilimnion)	Stable	Data not significantly increasing or decreasing.



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